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to elevate the standard of teaching. Such works sometimes hold forth no prospect of financial return. Abroad they often have the moral support and financial assistance of the government. But in this country some other agency, perhaps the Mathematical Association of America, must supply the need.

In concluding these brief remarks I wish to recommend to all who have not done so recently that they read the address delivered by the late Dr. Emory McClintock on the occasion of his retirement from the presidency of the American Mathematical Society in December, 1894. This address entitled "The Past and Future of the Society" was published in the *Bulletin* for January, 1895. From it I will quote a paragraph which should be of special interest to this newly established Association and of which a few lines have a ring almost prophetic:

"While the Society is not directly concerned in encouraging the study of the higher mathematics among the young, its indirect influence in that direction has undoubtedly been felt, and must be felt increasingly as time goes on. Years ago, when the present century was much younger, the course of study in our colleges was so arranged as to give a large proportion of the time of the undergraduates to the study of mathematics. Subsequently, the tendency in colleges having uniform courses of study was to cut down the number of hours given to this science, as well as to the classics, and to parcel out the time among the modern languages and various sciences. It is believed that even already the organization, the meetings, and the publications of the Society have, by the effect of numbers in association, perceptibly strengthened the tone of the mathematical departments of many institutions of learning and assisted in enabling them, more or less successfully, to stem the hostile tide of sentiment to which I have just referred. I say 'assisted,' for other agencies, especially the journals, have done great good. That the dissemination of knowledge concerning the gigantic strides lately made and still making in mathematical science must in the future have the same favorable effect to an even greater extent is not to be doubted."

NEW BOOKS RECEIVED.

SEND ALL COMMUNICATIONS TO W. H. BUSSEY, University of Minnesota.

TRIGONOMETRIC AND LOGARITHMETRIC TABLES. By George Wentworth and David Eugene Smith. Ginn and Company, Boston. v + 104 pages. \$0.60.

AN INTRODUCTION TO THE USE OF GENERALIZED COÖRDINATES IN MECHANICS AND PHYSICS. By William Elwood Byerly. Ginn and Company, Boston, 1916. vii + 118 pages. \$1.25.

ENGINEERING APPLICATIONS OF HIGHER MATHEMATICS. By V. Karapetoff. Part 1, Problems on machine design. Part 2, Problems on hydraulics. Part 3, Problems on thermodynamics. Part 4, Problems on mechanics of materials. Part 5, Problems on electrical engineering. John Wiley and Sons, New York, 1916. xv + 69, v + 103, v + 113, v + 81, v + 64 pages. \$0.75 per volume.

MODERN BUSINESS ARITHMETIC. By H. A. Finney and J. C. Brown. Henry Holt and Company, New York, 1916. v + 298 pages.

PLANE AND SOLID GEOMETRY. By William Betz and Harrison E. Webb. With the editorial coöperation of Percy F. Smith. Ginn and Company, Boston, 1916. xii + 507 pages. \$1.36.

BOOK REVIEWS.

Subjects for mathematical essays. By CHARLES DAVISON. Macmillan and Co., London, 1915. x + 160 pages. \$1.90.

At the outset we may say that the book can be used to advantage as a collection of problems by any teacher of mathematics. This, however, is not the object suggested by the title or by the author in his preface. "The object of what are here called 'mathematical essays' is to coördinate a pupil's knowledge on certain subjects not specially dealt with in textbooks."

Some of the essays certainly give the opportunity for coördination, though the animadversion on textbooks seems not always just. On page 114 we find "State and prove the leading properties in the theory of determinants," and on page 115 "Discuss the principle of proportional parts as applied to mathematical tables." It is not necessary to assume that the 'pupils' are prepared to give presidential addresses to learned societies to explain the presence of these 'subjects.' The trade mark (Trin. 1910) reveals that the pupils are preparing for scholarship examinations where they will be met by a perfectly cynical examiner who throws in just such questions for the purpose of separating the candidates widely.

The essays are not all of this type however; they descend to quite elementary sets of coördinated examples. Among the ways of coördinating the field of elementary mathematics we can scarcely expect to find many of really fundamental interest. A few styles occurring here may be noticed.

Euler's product theorem, page 81, has this set:

1. Prove that

$$\sin \theta = 2^n \cos \frac{\theta}{2} \cos \frac{\theta}{2^2} \cos \frac{\theta}{2^3} \cdots \cos \frac{\theta}{2^n} \sin \frac{\theta}{2^n}.$$

2. Prove that

$$\lim_{n \rightarrow \infty} \left(\cos \frac{\theta}{2} \cos \frac{\theta}{2^2} \cdots \cos \frac{\theta}{2^n} \right) = \sin \frac{\theta}{2}, \text{ etc.}$$

Here coördination apparently consists in taking the purely formal steps in the proof of a theorem and giving them as separate problems in the order required. If any object other than mnemonic is served it is hidden. The worst modern text would presumably say something about the convergence of an infinite product if only something wrong.

In "Euler's Polyhedron Theorem" (page 61) we have:

1. If a cube be constructed face by face, state the number of edges and vertices in the partially constructed figure for each value of F from 1 to 6.